

Adaptations 1: Flipping for Adaptations

Middle School Biodiversity Curriculum

Class Time Required:

1 class period (50-65 minutes)

Extension (30-45 minutes)

Materials Needed:

- Engagement: PowerPoint 1, “Adaptations 1: Flipping for Adaptations”
- Investigation and Explanation: Pennies, Colored Pencils, Worksheet 1, “Adaptations 1: Flipping for Adaptations”
- Extension: Resource Materials (books, textbooks, internet), 3 X 5 Notecards

Teacher Preparation: 30-60 minutes to review activity, collect materials, and print worksheets for distribution to students.

Student Knowledge: Basic understanding of the term “adaptation” and ability to give examples of adaptations in common animals, Research skills

Vocabulary: environment, adaptation, structural, behavioral, organism

Next Generation Science Standards:**• MS-LS1-4.**

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

• MS-LS1-5.

Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms

Overview:

Students begin this activity by watching a PowerPoint and sharing their prior knowledge about different animal adaptations. Students will first receive instruction about the two different types of animal adaptations—structural and behavioral. They will then use pennies to “flip” for different adaptations, in order to make a unique animal with characteristics from each of the five structural and five behavioral categories. Students will show what they have learned by drawing and writing about their “flipped” animal to encourage creativity and thoughtful response in how these adaptations help their animals survive in their unique environments. As an extension, students can do further research on specific animals and their adaptations by making “What Am I?” cards to play in class.

Background Information:

Animals develop different adaptations through time that promote the survival of individuals or species. Populations can change in response to changes in the environment. Adaptations can be grouped into two large categories: structural and behavioral (“Adaptation”, 2014). Structural adaptations involve a genetic change in the physical features of the body; for example, birds have evolved different types of beaks to eat different kinds of food; mammals have different sizes/shapes of ears adapted to the temperatures in their environment. Structural changes require a longer period of time, usually several generations, in order for animals to evolve new characteristics that assist with survival. Behavioral adaptations affect the way an organism interacts with its environment to survive. Such adaptations can occur more quickly, depending upon the intelligence of the animal. Behavioral adaptations can be dependent on social interactions and the organism’s ability to manipulate the environment; for example, animals may change behavior, depending on whether they are nocturnal or diurnal; some animals live in social groups and some live independently.

Focus Questions:

What allows one animal or species to survive over another?

What is the difference between structural and behavioral adaptations?

How can observations of an animal help us understand its ability to survive?



Learning Target:

I can describe and explain how different structural and behavioral adaptations help animals survive.

Engagement:

(10-15 minutes)

Use the PowerPoint 1, “Adaptations for Animal Survival” to engage students’ background knowledge about different adaptations animals have developed to survive in their environment.

Slides 1-5: What adaptations do these animals have that help them to survive?

Slides 6-9: Give an explanation of the two types of adaptations: structural and behavioral. For each slide, point out specific adaptation for the animals, using the words “structural” and “behavioral” in the explanations.

Investigation:

(25-30 minutes)

1. Students are given two pennies and Worksheet 1: “Flipping for Adaptations” with a list of structural and behavioral adaptations that their animal might have for survival.
2. Students will flip two pennies to determine the adaptations of their animals. After each flip, students will circle the corresponding adaptation.
3. After flipping for all adaptations, students will draw a picture of their “animal” in the box, with labels for the flipped adaptations. Students must also put their animal in an environment in which it would be able to survive.

Explanation:

(15-20 minutes)

Students will write a paragraph describing the type of environment in which their animal would live and the adaptations it has that enables it to survive in that environment.

Extension:

(30-45 minutes)

Students will research and write "What Am I?" cards, with clues (adaptations) for a specific animal. Each card will contain five clues that go from a very general clue to a more specific clue. The game is played similarly to "20 Questions." After reading the first clue, the other student(s) are allowed three guesses to correctly identify the animal. If the animal is not guessed within the three chances, the next clue is read. The game continues in this manner until the correct animal is guessed. Students can quiz each other, or the teacher can collect and quiz the entire class.

Example:

What Am I?	Penguin
<ol style="list-style-type: none">1. This animal has a layer of blubber beneath its skin to help keep it warm.2. This animal is white on the front and black on the back to provide camouflage from predators.3. Most species of these animals live in groups.4. These animals will preen with oil taken from a gland located at their base of their tails.5. To travel on ice, these animals slide on their bellies, using their flippers and feet to move.	

References:

"Adaptation." - *National Geographic Education*. Ed. Kara West and Jeannie Evers. National Geographic, n.d. Web. 02 Sept. 2014.

<http://education.nationalgeographic.com/education/encyclopedia/adaptation/?ar_a=1>

Encyclopedia of Life. Available from <http://www.eol.org>. Accessed 15 June 2014

"PENGUINS - Adaptations for an Aquatic Environment." *PENGUINS - Adaptations for an Aquatic Environment*. Sea World Parks and Entertainment, n.d. Web. 19 Aug. 2014.
<<http://seaworld.org/animal-info/animal-infobooks/penguin/adaptations>>